Urological Science 26 (2015) 240–242

Contents lists available at ScienceDirect

Urological Science

journal homepage: www.urol-sci.com

Original article

Percutaneous cystostomy drainage for early removing urethral catheter in robotic-assisted laparoscopic radical prostatectomy: Improving on patients' discomfort

Che-Jui Yang, Yen-Chuan Ou*, Chun-Kuang Yang

Divisions of Urology, Department of Surgery, Taichung Veterans General Hospital, Taiwan, ROC

ARTICLE INFO

Article history:
Received 23 April 2014
Received in revised form
14 January 2015
Accepted 15 January 2015
Available online 10 March 2015

Keywords:
early removal of urethral catheter
percutaneous cystostomy
robotic-assisted laparoscopic radical prostatectomy

ABSTRACT

Objective: Urethral catheterization is often a major source of discomfort and pain to a patient after a surgical procedure. To better understand the safety and feasibility of the early removal of urethral Foley catheter after robotic-assisted laparoscopic radical prostatectomy by using percutaneous cystostomy drainage, we collected the related data and present our experience.

Patients and methods: This study involved 20 patients. In the study group (10 patients), we used the percutaneous cystostomy device (PCD) and an 18 French urethral catheter together. The urethral catheter was removed at postoperative day (POD) 3 and the PCD was removed at POD 7. In the control group (10 patients), they had standard urethral catheterization with an 18 French catheter and the catheter was removed at POD 7. Demographic and outcome data were measured and analyzed. Urethral pain was recorded using the visual analog scale.

Results: The two groups were comparable in terms of age, serum prostate specific antigen level, body mass index, clinical tumor stage, surgical duration, estimated blood loss, and surgical times. The study group had significantly less penile pain in POD 3 and POD 7 (mean visual analog scale: 0.9 vs. 2.2, $p < 0.001$ at POD 3; 0.1 vs. 1.4, $p = 0.002$ at POD 7). All patients had good urinary continence within 30 days and no urethra stricture was found during the follow up period.

Conclusion: The use of a percutaneous cystostomy device is feasible and safe for the early removal of urethral Foley catheter in robotic-assisted laparoscopic radical prostatectomy to decrease penile pain and patient discomfort.

1. Introduction

Robotic-assisted laparoscopic radical prostatectomy (RALP) has become a common procedure in the treatment of clinically localized prostate cancer. This minimally invasive procedure offers the benefits of earlier continence, a shorter recovery time, and minimal blood loss.[1,2] Traditionally, the urethral catheter is placed for splinting the anastomosis; it prevents the formation of cross-synechia and drains the urinary bladder. However, the urethral catheter is also a major source of patient discomfort in the post-operative period.[3] The duration of urethral catheterization is about 5–7 days in most minimally invasive series.[4,5] The purpose of this study was to examine the feasibility and safety of draining the bladder with a percutaneous cystostomy device (PCD) for early removal of the urethral catheter. In this study, we describe our surgical procedures and the placement of PCD. We also discuss pain, discomfort of patients, functional results, and related complications.

2. Patients and methods

This was a prospective, nonrandomized pilot study approved by the Institutional Review Board of Taichung Veterans General Hospital, Taichung, Taiwan (No. CE13240). All patients were completely informed and provided consent. Between July 2012 and August 2013, 10 men undergoing RALP were offered the option of PCD placement for urinary bladder drainage and another 10 men undergoing RALP were involved as the control group. We used the 10 French Cystofix (B. Braun Melsungen, Germany; Fig. 1), which is a balloonless, pigtail-like tube, as the percutaneous cystostomy device.

* Corresponding author. Divisions of Urology, Department of Surgery, Taichung Veterans General Hospital, 160 Section 3, Taichung-Kang Road, 40705, Taiwan, ROC.
E-mail address: ycou228@gmail.com (Y.-C. Ou).

http://dx.doi.org/10.1016/j.urols.2015.01.004

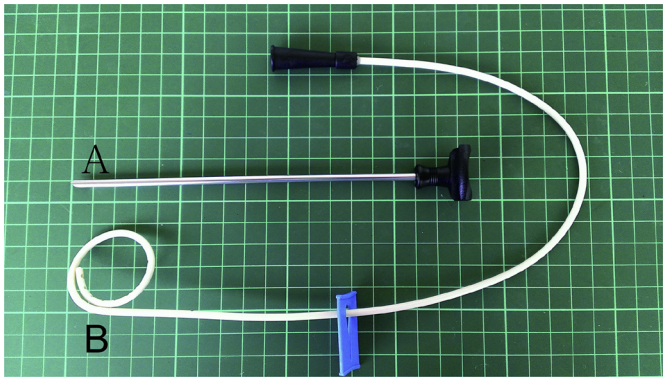

Fig. 1. Percutaneous cystostomy devsice (Cystofix). (A) Puncture set. (B) Balloonless pigtail-like catheter.

All the surgical procedures were performed by one surgeon. We performed the RALP procedure as described in the previously study.[6] The vesicourethral anastomosis (VUA) was made with two layers of reconstruction. The first layer was posterior reconstruction with a rhabdosphincter.[7] Then, anastomosis was performed by using two 18 cm 3-O Monocryl continuous sutures (Ethicon, Mexico), starting at the 5-o'clock position and continuing to the 11-o'clock position where sutures were tied together.[8] The VUA was challenged with 200 mL saline intraoperatively to confirm if any leakage existed.[9] The cystogram was almost not needed prior to the removal of the urethral catheter. In the PCD group, the PCD was inserted in the suprapubic area under direct vision by laparoscope in the first three patients (Fig. 2). The PCD was put through the wound for the second arm of the robotic system in the remaining seven patients (Fig. 2). The 18 French urethral catheter was inserted with a 20-mL balloon. The urethral catheter was removed at postoperative Day (POD) 3. The PCD was removed at POD 7. In the control group, the 18 French urethral catheter was used and was removed at POD 7.

The wound pain and penile pain were evaluated by visual analog scale (VAS) at POD 3 and POD 7. We also measured urinary continence and the incidence at 6 months of bladder neck contracture between the two groups.

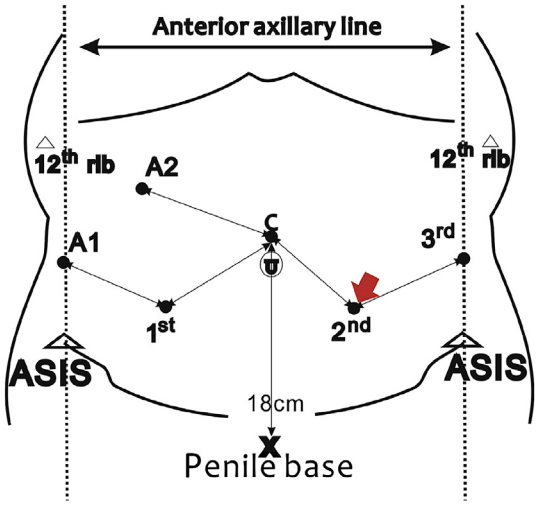

Fig. 2. Percutaneous cystostomy from the wound for the second arm of the robotic system. The red arrow indicates the site of the percutaneous cystostomy. A = assistant port 1; A2 = assistant port 2; C = camera port; 1st = first arm of robotic system; 2nd = second arm of robotic system; 3rd = third arm of robotic system.

The Chi-square test and Student *t* test were used to compare the group characteristics and the pain score a, with critical values and statistical significance at $p < 0.05$.

3. Results

The clinical characteristics of all 20 men undergoing RALP from July 2012 to August 2013 are outlined in Table 1. There were no differences between the two groups with regard to age, body high, body weight, body mass index (BMI), prostate-specific antigen (PSA) level, clinical stage, American Society of Anesthesiologists (ASA) score, surgical time, and blood loss. The mean time for PCD insertion was 6.6 minutes (range: 4–10 minutes). The VAS for wound pain and penile pain are shown in Table 2. The mean VAS of wound pain at POD 3 and POD 7 in the PCD group were 2.2 (range: 1–3) and 0.5 (range: 0–1), respectively. This was slightly lower than in the control group but there was no statistically significant difference between these two groups ($p = 0.394$ and $p = 0.081$ respectively). The patients in the PCD group had significantly decreased penile pain in POD 3 and POD 7 (mean VAS: 0.9 vs. 2.2, $p < 0.001$ at POD 3; 0.1 vs. 1.4, $p = 0.002$ at POD 7). The PCD was dislodged at POD 4 in one patient. The urinary bladder scan after voiding showed residual urine <50 mL. This patient was closely followed. There was no urinary leakage in either group. All 20 patients had good urinary continence (no need for pad) within 30 days at follow-up. At 6 months' follow-up, no patient in either group required either cystoscopy or urethral dilation for bladder neck contracture or urethral stricture.

4. Discussion

The urethral catheter is used for stenting the anastomosis and drains the urinary bladder in patients undergoing RALP. However, it is also a major source of patient discomfort in the postoperative period. Lepor et al[10] reported that 54% of patients indicated that the

Table 1
Clinical characteristics of all 20 cases.

	PCD group	Control group	*p*
Mean age (range)	64.6(49–74)	68.5(61–74)	0.304
Mean body high, cm(range)	166.3(155.5–172)	164.3 (145–172)	0.404
Mean body weight, kg(range)	69.6(55.5–79)	64.4(55–78)	0.185
Mean BMI, kg/m^2 (range)	25.16(22.14–29.35)	23.83(19.26–27.97)	0.302
Mean PSA, ng/ml (range)	18.42(7.15–51.8)	16.69(5.1–60)	0.517
Clinical stage			0.869
cT1	2	3	
cT2	7	6	
cT3	1	1	
ASA			0.819
I	1	1	
II	7	8	
III	2	1	
Mean OP time, min (range)	105(80–160)	102(70–120)	0.735
Mean blood loss, mL (range)	63(30–100)	50.5(10–100)	0.345

BMI = body mass index; OP = operation; PCD = percutaneous cystostomy device; PSA = prostate-specific antigen.

Table 2
Evaluation of discomfort.

	PCD group	Control group	*p*
VAS, mean ± SD			
Wound pain, POD 3	2.2 ± 0.63	2.5 ± 0.70	0.394
Wound pain, POD 7	0.5 ± 0.53	1.1 ± 0.57	0.081
Penile pain, POD 3	0.9 ± 0.56	2.2 ± 0.42	<0.001
Penile pain, POD 7	0.1 ± 0.32	1.4 ± 0.84	0.002

PCD = percutaneous cystostomy device; POD = postoperative day; SD = standard deviation; VAS = visual analog scale.

urinary catheter limited their physical activities during recovery. A meta-analysis of patients undergoing laparotomy also showed that patients with urethral catheterization are more likely to experience substantial bacteriuria and pain or discomfort than patients undergoing suprapubic cystostomy.[11]

Tewari et al[12] reported patients undergoing RALP with a special-designed double balloon suprapubic catheter that passes through the anastomosis into the urethra. There was substantially less penile shaft or tip pain and discomfort in the study group. Orikasa et al[13] used an 18-French special handmade suprapubic cystostomy tube in patients undergoing radical prostatectomy and also showed fewer urinary symptoms during catheterization and painful micturition after catheter removal. Ghani et al[14] described using primary suprapubic bladder drainage without a urethral extension after RALP in their institution. Two hundred and two patients undergoing RALP received percutaneous suprapubic tube (PST). The patients with PST had a significantly decreased catheter-related discomfort and less anticholinergic medication use. However, 10 patients needed reinsertion of their urethral catheter due to PST dislodgement ($n = 5$) or urinary retention ($n = 5$).[15] The results of the study also indicated that urethral stenting may not be as crucial as previously thought in watertight VUA.

Prasad et al[16] criticized the real benefits of suprapubic tube after radical prostatectomy. They point out that 79% of patients responded that the catheter was the most bothersome immediately after the operation but was eased considerably by the next morning. With a percutaneous suprapubic tube, patients may be at risk of reinsertion of the urethral catheter and cicatrix formation at the VUA. In the institution of Prasad et al,[16] they performed a randomized controlled trial including 58 patients to evaluate the benefits of PST in RALP.[17] The results showed no difference between the groups at any time points in pain and similar percentages of patients cited the catheter as their greatest bother.

In our study, we used the balloonless pigtail-like tube as our percutaneous cystostomy device. It not only helped to avoid pain from urethral catheterization but also decreased balloon-related discomfort. We avoided the term “suprapubic” because we put the PCD through the wound for the second arm of the robotic system in seven patients. Therefore, we were able to avoid another wound on the patient's abdomen. In our study, the setting did not increase the risk of urinary leakage from the cystostomy prior to or after removal of the PCD. In the study, the PCD group had substantially less penile pain in POD 3 and POD 7 (mean VAS: 0.9 vs. 2.2, $p < 0.001$ at POD 3; 0.1 vs. 1.4, $p = 0.002$ at POD 7). As Prasad et al[16] point out, the penile pain was considerable in all 20 patients (range: 0–3) but we thought that any improvement in patient discomfort was a worse outcome. All 20 patients' continence was good within 30 days and no urethral stricture or bladder contracture was noted at 6 months' follow-up. These findings showed that PCD did not increase the risk of incontinence or cicatrix formation at the VUA.

This was a nonrandomized study with small case numbers. In this study, using PCD for draining the bladder and early removal of urethral catheter after RALP is feasible and safe. It may offer patients another way in which to reduce discomfort from urethral catheterization. However, further studies are needed in order to provide stronger evidence of the benefits of this method.

5. Conclusion

A PCD can be used without increased perioperative morbidity and will reduce penile pain. Continence rates were the same as those with conventional urethral drainage. No urethral stricture or bladder neck stricture was noted at 6 months' follow-up. Based on these results, this method may be a good choice for patients undergoing RALP.

Conflicts of interest

The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in the manuscript.

Sources of funding

No funding was received for the work described in this article.

References

1. Tewari A, Srivasatava A, Menon M. A prospective comparison of radical retropubic and robot-assisted prostatectomy: experience in one institution. *BJU Int* 2003;**92**:205–10.
2. Tewari AK, Bigelow K, Rao S, Takenaka A, El-Tabi N, Te A, et al. Anatomic restoration technique of continence mechanism and preservation of puboprostatic collar: a novel modification to achieve early urinary continence in men undergoing robotic prostatectomy. *Urology* 2007;**69**:726–31.
3. Albani JM, Zippe CD. Urethral catheter removal 3 days after radical retropubic prostatectomy is feasible and desirable. *Prostate Cancer Prostatic Dis* 2002;**5**:291–5.
4. Patel VR, Thaly R, Shah K. Robotic radical prostatectomy: outcomes of 500 cases. *BJU Int* 2007;**99**:1109–12.
5. Tewari A, Rao S, Martinez-Salamanca JI, Leung R, Ramanathan R, Mandhani A, et al. Cancer control and the preservation of neurovascular tissue: how to meet competing goals during robotic radical prostatectomy. *BJU Int* 2008;**101**:1013–8.
6. Ou Y-C, Yang C-R, Wang J, Cheng C-L, Patel V. Robotic-assisted radical prostatectomy by a single surgeon in Taiwan: experience with the initial 30 cases. *J Robotic Surg* 2008;**2**:173–9.
7. Ou YC, Yang CR, Wang J, Cheng CL, Patel VR. Comparison of robotic-assisted versus retropubic radical prostatectomy performed by a single surgeon. *Anticancer Res* 2009;**29**:1637–42.
8. Van Velthoven RF, Ahlering TE, Peltier A, Skarecky DW, Clayman RV. Technique for laparoscopic running urethrovesical anastomosis: the single knot method. *Urology* 2003;**61**:699–702.
9. Chen CC, Yang CK, Hung SW, Wang J, Ou YC. Outcome of vesicourethral anastomosis after robot-assisted laparoscopic radical prostatectomy: a 6-year experience in Taiwan. *J Formos Med Assoc* 2014. http://dx.doi.org/10.1016/j.jfma.2013.12.007.
10. Lepor H, Nieder AM, Fraiman MC. Early removal of urinary catheter after radical retropubic prostatectomy is both feasible and desirable. *Urology* 2001;**58**:425–9.
11. McPhail MJ, Abu-Hilal M, Johnson CD. A meta-analysis comparing suprapubic and transurethral catheterization for bladder drainage after abdominal surgery. *Br J Surg* 2006;**93**:1038–44.
12. Tewari A, Rao S, Mandhani A. Catheter-less robotic radical prostatectomy using a custom-made synchronous anastomotic splint and vesical urinary diversion device: report of the initial series and perioperative outcomes. *BJU Int* 2008;**102**:100–4.
13. Orikasa S, Kanbe K, Shirai S, Shintaku I, Kurosu S. Suprapubic versus transurethral bladder drainage after radical prostatectomy: impact on patient discomfort. *Int J Urol* 2012;**19**:587–90.
14. Ghani KR, Trinh QD, Sammon JD, Jeong W, Simone A, Dabaja A, et al. Percutaneous suprapubic tube bladder drainage after robot-assisted radical prostatectomy: a step-by-step guide. *BJU Int* 2013;**112**:703–5.
15. Krane LS, Bhandari M, Peabody JO, Menon M. Impact of percutaneous suprapubic tube drainage on patient discomfort after radical prostatectomy. *Eur Urol* 2009;**56**:325–30.
16. Prasad SM, Smith ND, Catalona WJ, Sammon J, Menon M. Suprapubic tube after radical prostatectomy. *J Urol* 2013;**189**:2028–30.
17. Prasad SM, Large MC, Patel AR, Famakinwa O, Galocy RM, Karrison T, et al. Randomized controlled trial of early removal of urethral catheter with suprapubic tube drainage versus urethral catheter drainage alone following robot-assisted laparoscopic radical prostatectomy. *J Urol* 2014;**192**:89–95.